

Bringing science closer to the people!

What are we doing during the summer holidays?

We are participating in the iGEM competition!



What is the iGEM competition?

It is a competition between mainly **students**. We are in the iGEM 2015 team of the KU Leuven, the only team from Belgium. We will compete against 280 other teams from all over the **world**.

We are working in Leuven during the summer and will defend our work in **Boston** in front of the other competitors and a jury. This defence will be between 24th and the 28th of September. So the project runs throughout the whole summer period, but we do have some free time for a trip or retakes.

The iGEM competition is the most prestigious competition in **synthetic biology**. Its goal is to stimulate scientific research and education. It also leads to collaborations throughout the world. Their ultimate goal is to have a positive impact on the field of synthetic biology itself.

What is synthetic biology?

Synthetic biology is a part of science where **biologists** and **engineers** work together. This collaboration makes it possible to build new and useful biological systems. And this is exactly what we do: every team has to create a **new organism** with a useful application in our society. This explains the name of iGEM: (International) Genetically Engineered Machine. This 'Machine' refers to the new organism we need to create. In most cases in the competition, the organism changed is a bacterium, one that is naturally present in our intestines, and is fully un-harmful. We slightly change its DNA – the building block of every organism – so that it is able to do a specific task. By changing the DNA, we change the properties of the organism so that it behaves as we would like them to behave. So, 'Genetically Engineered' refers to the fact that we change the DNA, more precisely: the genes.

Synthetic biology - and so also the iGEM competition - can lead to very interesting projects, for example letting micro-organisms produce biofuel. After changing the DNA, the organisms are able to produce high amounts of biofuel out of waste creating a green alternative for the current unsustainable fuel production. Projects can also have futuristic applications in for example agriculture, environment and medicine.

What is our project for the competition about?

Our project is called '**Spot E. shape**'. In nature, you can see a lot of patterns. Think of the nerves of a leaf or the fingers of our hand. Scientists do not exactly know how these are formed in a specific pattern or number. We want to find this out, we want to understand what is happening in nature. To reveal the secrets of nature, we are creating bacteria with specific traits. Bacteria will form **patterns** on a **plate**, because we add some traits so that one cell is repelling or attracting the other one.

The cool thing is: if we are able to make bacteria forming a pattern, then we would additionally make them producing some components. Because bacteria are so small, they will be able to produce **tiny structures**. This can lead to inventive biomaterials with specific applications in industry.

Understanding nature is also important for the **medical** world: think of tumour formation and tissue regeneration. In the future, it can also have applications in **art**. More detail of our project can be found on our iGEM [wiki-page](#).

Who is in the KU Leuven team?

13 enthusiastic students: the lucky **13 team** was selected based on a CV, a motivation letter and an interview. For the work, we are guided by a PhD student and a professor. Of course, there are more people advising us.

We are a team of students from the **different faculties**: Bioscience Engineering, Sciences, Engineering Science, Medicine and Economics & Business. So, you can really call it a nice mixture, or in other words very 'multidisciplinary'. You can find our names, pictures and description on [Facebook](#).

The KU Leuven has already participated at the iGEM competition four times: in 2008, 2009, 2011 and 2013. For every participation a new team was selected. The KU Leuven achieved success in the competition, so the expectations are high.

What are the tasks for the team?

We will do **wet lab** experiments. This means we will have to change the DNA of our bacteria, do preparations, do measurements, test if everything is going well, ...

Other tasks of students of the team are **computational modelling**: these students are sitting in front of a computer screen most of the time, using a lot of mathematical formulas, typing codes, ...

The models of our computer experts in fact say what in theory should happen with the bacterial cells. But the cells are not always behaving as we think they would, because we don't know everything about them. That is why the results of the lab experiments will be used as an input for the computer models again. So that in the end, we will be able to really predict what the cells are going to do. We in fact get to know our cells more and more.

We will also do an **ethical** reflection, because of course, if you create new organisms, you have to think of the consequences. It is possible that we will organise a debate. We will also **visit schools** to educate and encourage possible future scientists. So we have to make our educational material ourselves.

Other tasks are **communication**, **logistics**, and reaching **sponsors**. Of course, we need money for our lab experiments, the enrolment for participating the competition, PR and marketing and for travelling to the USA. Our business student will also write a **business plan** of our project.

Why do students want to join this competition?

It feels great to be a part of the **improvement** of science, leading to innovations in society. This project also gives us a **nice experience** including building a network, learning things from students with a different background, improving scientific and communication skills, team work, ... Eventually, this means this project is also a nice boost to our CV.

What have we already done?

We had to **come up** with a **project idea** for this competition ourselves, so previous semester, we had a lot of meetings for sharing our ideas for the project and we worked them out. We also already had an official event to present our project to sponsors and old-iGEM-team members. We are full time working on the project for more than a month now.

When will it be finished?

Depending on the success of the project, there will be no end! Since the science will always go on, and on, and on!

The official end of the iGEM competition is the defence in Boston at the **end of September** where we will go with the whole group to present and explain our hard work to the judges and – hopefully – win the competition! The experience earned and the new friendships will never get lost...

Do you want to know more? Do you want to keep in touch? Check our iGEM [wiki-page](#) and follow us on [Facebook](#) or on [Twitter](#). Also in media, you will definitely see our iGEM-team at work.

Questions or remarks? Please contact us!